CLAIMS

1. A method comprising steps of:

supplying a precursor gas for growing a polycrystalline silicon-germanium region and a single crystal silicon-germanium region;

growing said polycrystalline silicon-germanium region in a mass controlled mode at a first pressure of said precursor gas and a first temperature;

growing said single crystal silicon-germanium region in a kinetically controlled mode at said first pressure of said precursor gas and said first temperature.

2. The method of claim 1 wherein said precursor gas comprises germanium and hydrogen.

3. The method of claim 1 wherein said polycrystalline silicon-germanium region is in contact with said single crystal silicon-germanium region.

4. The method of claim 1 wherein said polycrystalline silicon-germanium region is a base contact in a heterojunction bipolar transistor.

5. The method of claim 1 wherein said single crystal silicon-germanium region is a base in a heterojunction bipolar transistor.

6. The method of claim 1 wherein said first pressure is approximately 100 Torr.

7. The method of claim 1 wherein said first temperature is approximately 650° C.

8. The method of claim 1 wherein said single crystal silicon-germanium region comprises approximately 8% germanium and 92% silicon.

9. The method of claim 1 wherein said polycrystalline silicon-germanium region grows approximately twice as fast as said single crystal silicon-germanium region.

10. A method for fabricating a heterojunction bipolar transistor, said method comprising steps of:

growing a collector in a silicon substrate;

growing in a kinetically controlled mode a single crystal silicon-germanium base forming a junction with said collector;

growing in a mass controlled mode a polycrystalline silicon-germanium base contact for electrical connection to said base;

growing a polycrystalline silicon emitter forming a junction with said base.

11. The method of claim 10 wherein said growing in said kinetically controlled mode is performed concurrently with said growing in said mass controlled mode.

12. The method of claim 10 further comprising a step of supplying a precursor gas prior to said step of growing in said kinetically controlled mode.

13. The method of claim 12 wherein said precursor gas comprises hydrogen and germanium.

14. The method of claim 12 wherein said step of growing in said kinetically controlled mode and said step of growing in said mass controlled mode are performed at a pressure of approximately 100 Torr and a temperature of approximately 650° C.

15. The method of claim 10 wherein said base comprises approximately 8% germanium and 92% silicon.

16. The method of claim 10 wherein said polycrystalline silicon-germanium base contact grows approximately twice as fast as said single crystal silicon-germanium base.

17. The method of claim 10 wherein said base contact has a resistance of approximately 650 ohms per micrometer.

18. A structure comprising:

a collector comprising a single crystal silicon;

a base comprising a single crystal silicon-germanium, wherein said base is grown in a kinetically controlled mode at a first temperature and a first pressure of a precursor gas, said base and said collector forming a base-collector junction;

an emitter comprising polycrystalline silicon, said emitter and said base forming a base-emitter junction;

a base contact comprising polycrystalline silicon-germanium, said base contact being in electrical contact with said base, wherein said base contact is grown in a mass controlled mode at said first pressure and said first temperature of said precursor gas.

19. The structure of claim 18 wherein said base contact is grown concurrently with said base.

20. The structure of claim 18 wherein said precursor gas comprises germanium and hydrogen.

21. The structure of claim 18 wherein said first pressure is approximately 100 Torr.

22. The structure of claim 18 wherein said first temperature is approximately 650° C.

23. The structure of claim 18 wherein said base comprises approximately 8% germanium and 92% silicon.

24. The structure of claim 18 wherein said base contact resistance is approximately 650 ohms per micrometer.